shown. Read the legend data in the margin and remember that the NAD 27 SPCS ticks will have values labelled in consistently sized numerals and will be labelled “feet.” UTM grid values are in dual sized numerals followed by a lower case “m” for meters and a direction. Graticule ticks are labelled with degree and/or minute and second marks. All systems are differentiated by tick placement on the graticule or by weight of line.

Datums:

The last topic we need to consider is the subject of datums. As we have previously defined, a datum is the basis for calculation of further quantities. In the U.S.mapping, cartographers are concerned with two kinds of datums, one for the horizontal surveys of the land and one for the vertical determination of heights above sea level. We shall consider only the first here.

For over 60 years, the United States, Canada and Mexico have based surveys and maps on North American Datum 1927 on the Clarke 1866 ellipsoid. NAD 27 has an initial point at Meades Ranch, Kansas, in the area where major transcontinental survey chains (east-west and north-south) cross. These chains and other surveys were mathematically adjusted to this origin. Other datums are used in foreign areas, such as Indian Datum on the Everest Spheroid for India and European Datum on the International Ellipsoid.

In 1980, the U.S. adopted a new estimate of the size and shape of the earth called the Geodetic Reference System (GRS) 1980. Using this new ellipsoid, NAD 27 has been adjusted to become NAD 83(adopted in 1986), the preferred current datum. This change altered the coordinate values of all points which had been based on NAD 27, affecting graticules and, as we have mentioned, both of our commonly used grids. These differences arise because:

- Surveys were adjusted to NAD 27 on a piecemeal basis; the adjustment to NAD 83 was simultaneous.

- New techniques such as electronic distance measurement and very long baseline interferometry have improved the 1983 network of surveys.

- The GRS 80 is a better approximation of the size and shape of the earth then the Clarke 1866 spheroid.